

FEEDBACK SYSTEMS

The endocrine system runs on both negative and positive feedback, though it's mostly negative feedback.

Negative feedback works like a thermostat and a radiator. When the temperature is below a certain point, the thermostat will detect this change and signal to the radiator to cut in. As long as the signal is coming from the thermostat, the radiator will stay on. When the heat increases the thermostat detects this change and cuts off the signal to the radiator. With the heaters shut off, the heated air will cool, this will then be detected by the thermostat and the process will begin again. This maintains a fairly constant room temperature - homeostasis.

Most homeostatic actions are negative feedback. This means that the release of an initial hormone stimulates the production and release of another hormone(s). When the levels of the other hormone build to a point where the system detects it, the initial hormone production stops.

Negative feedback loops work like this:

Hypothalamus

Pituitary

Other endocrine glands

This results in a very stable system. It helps to maintain hormone concentrations at particular levels. A good example of this would be TSH and thyroxine.

Positive feedback is the opposite. Initial hormone release triggers production of hormones and/or other substances which stimulate further release of the initial hormone. This does not result in homeostasis, as it is not a stable system. It usually triggers a sudden event. The hormone oxytocin triggers labour and childbirth.

Questions: Classify the following as positive or negative feedback:

- TSH and thyroxine
- oxytocin
- ADH
- insulin
- calcitonin and parathyroid

Do a flow chart to show the steps in:

- TSH and thyroxine
- insulin control of blood sugar